

Name: \_\_\_\_\_

## at1121exam\_practice: Radicals and Squares (v3)

### Question 1

Simplify the radical expressions.

$$\sqrt{45}$$

$$\sqrt{12}$$

$$\sqrt{28}$$

$$\frac{\sqrt{3 \cdot 3 \cdot 5}}{3\sqrt{5}}$$

$$\frac{\sqrt{2 \cdot 2 \cdot 3}}{2\sqrt{3}}$$

$$\frac{\sqrt{2 \cdot 2 \cdot 7}}{2\sqrt{7}}$$

### Question 2

Find all solutions to the equation below:

$$\frac{(x+7)^2}{9} - 7 = 2$$

First, add 7 to both sides.

$$\frac{(x+7)^2}{9} = 9$$

Then, multiply both sides by 9.

$$(x+7)^2 = 81$$

Undo the squaring. Remember the plus-minus symbol.

$$x+7 = \pm 9$$

Subtract 7 from both sides.

$$x = -7 \pm 9$$

So the two solutions are  $x = 2$  and  $x = -16$ .

### Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 10x = -9$$

$$x^2 - 10x + 25 = -9 + 25$$

$$x^2 - 10x + 25 = 16$$

$$(x - 5)^2 = 16$$

$$x - 5 = \pm 4$$

$$x = 5 \pm 4$$

$$x = 9 \quad \text{or} \quad x = 1$$

### Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 - 16x + 25$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 - 8x) + 25$$

We want a perfect square. Halve -8 and square the result to get 16 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 - 8x + 16 - 16) + 25$$

Factor the perfect-square trinomial.

$$y = 2((x - 4)^2 - 16) + 25$$

Distribute the 2.

$$y = 2(x - 4)^2 - 32 + 25$$

Combine the constants to get **vertex form**:

$$y = 2(x - 4)^2 - 7$$

The vertex is at point  $(4, -7)$ .